

4 Kelvin Cooling with Innovative Final Stage of Multistage Cryocooler, Phase I

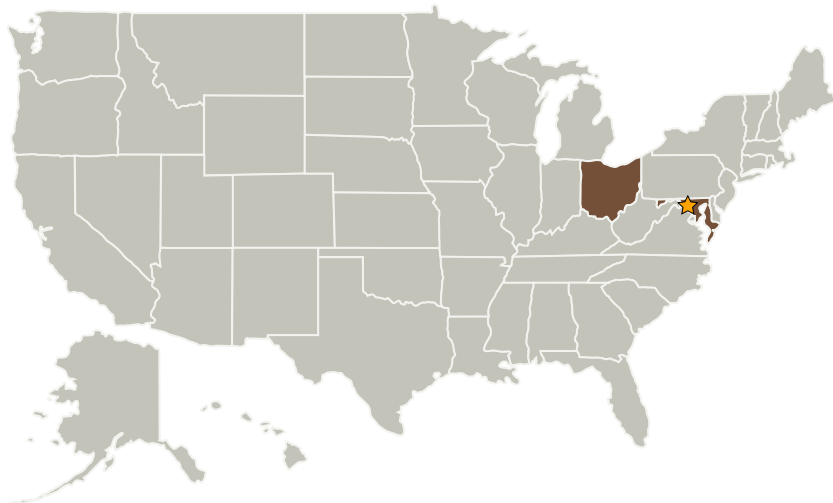
Completed Technology Project (2006 - 2006)



Project Introduction

Proposed for development is a proof-of-concept prototype for the final stage of a multistage cryocooler. This final stage comprises a high frequency pulse tube cold head that cools from an intermediate temperature of 10?20 K down to below the critical temperature of helium (5.2 K) using an alternate approach compared to conventional technology. This approach offers unique advantages that have never before been explored and will allow us to achieve high thermodynamic efficiency with compact size, using ordinary helium as the working fluid. The first and second stages that will eventually pre-cool the third stage cold head can be either existing commercial Sunpower Stirling cryocoolers or pulse tube technology now under development. If the third stage cold head proves successful all the pieces will be in place for developing a compact, efficient and reliable cryocooler.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Sunpower, Inc.	Supporting Organization	Industry	Athens, Ohio



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Maryland

Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.1 Cryogenic Systems
 - └ TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors